

17-437 / 17-637: Web Application Development

Fall 2021 Syllabus

Updated September 7, 2021

This course will introduce concepts in programming web application servers. At the conclusion of this course you will understand the fundamental concepts of software engineering and how they apply to web application design and programming, will know the modern tools used to program web application servers, and will be able to produce substantial web applications as part of a team. This course will introduce web application concepts primarily using Django/Python technologies, and you will be able to generalize these concepts to other web application technologies and tools.

During the first part of the semester we will have a series of homework assignments in which you build two increasingly sophisticated web applications. The second part of the course will focus on a larger project, in which you will design and implement a substantial dynamic web site of your choice as part of a project team. At the conclusion of your project you will demonstrate your web site to the course staff. We are planning to have a final exam (though no mid-term) in this course, this semester.

Class Meetings

Assuming there are no pandemic-related restrictions, this course will have in-person lectures on Tuesdays and Thursdays from 3:05pm to 4:25pm in Posner Hall Room A35. Even though we will make lecture recordings available to you, you are strongly encouraged to attend lectures so that you can participate in the in-class exercises (which are not recorded), as well as to be able to take the in-class quizzes.

Most meetings, primarily in the first half of the course, will consist of a ~60-minute lecture followed by a ~20-minute in-class exercise/quiz. The exercise/quiz is designed both to reinforce the lecture material you just heard, and to help you meet other students in the course.

- If you are unable to attend a lecture, **you will** be able to watch a recording later. The lecture video should be posted about two hours after class ends.
- If you are unable to attend a lecture, you may **not** be able to do the exercise/quiz, so you'll lose the opportunity to earn credit on the quiz. While some exercises/quizzes can be done after lecture, most cannot.
 - In general, we do not offer make-up quiz sessions.
 - We will offer make-up quiz sessions for students in isolation/quarantine or with other short-term medical issues, if we are appropriately notified -- see below.
 - If there's a major COVID outbreak, things could change -- see below.

The second half of the semester will include several project-related meetings held mostly during class time and on the Zoom platform. Final project demos are planned to be held in person (though this could change due to COVID concerns, in which case demos will also be held on Zoom).

The Zoom link for all lecture-related activities (Sprints, make-up quizzes, and, if needed, demos) is:
<https://cmu.zoom.us/j/91917936136?pwd=eDg1MXR6anJjd20rT3ZUd2dMbXBadz09>

Note: You'll need to sign-in with your Andrew ID. If there are problems, we'll post on Piazza.

The TAs will hold office hours in-person and/or **online**. Times for office hours will be posted on the course Google calendar (<https://www.cmu-webapps.org/calendar>) and location/connection information will be posted on Piazza. (The Zoom link above will not be used for office hours.)

Pandemic-related Logistics

If (due to the pandemic) we need to switch to an all-remote teaching mode, this course will meet, live, via Zoom, on Tuesdays and Thursdays from 3:05pm to 4:25pm US Eastern Time, using the Zoom link shown above. (And then the quizzes/exercises will live, via Zoom.)

If you get sick or are in isolation/quarantine, then student health, student affairs, or your advisor can notify us (without providing details) that you cannot attend class. In this case, we will schedule make-up quiz/exercise sessions for you. (And you can watch the recorded lectures, as always.)

Prerequisites

Students will be working with a significant amount of code, so students need to have good programming skills. Ability to program in Python is assumed. If you do not know the Python language, you must have the ability to learn it quickly on your own (and you will need to do so immediately). For undergraduates, either 15-213 or 17-214 (or their various cross-listings) is required. Prerequisite courses for graduate students are not enforced, but they must have commensurate background.

Students will need a reasonably modern laptop on which to do assignments and to participate in classroom exercises/demonstrations. Laptops may be of the Windows, MacOS, or Linux variety. Students will need to install and run the Chrome and Firefox browsers as well as Git, Python 3 and Django 3 software.

Course Staff

Instructors:

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Communications

- Canvas will be used to provide links to:
 - Lecture videos
 - Lecture slides
 - Code from examples shown in lecture
 - Cloud deployments of lecture examples
 - In-class quizzes
- Piazza will be used for:
 - Q&A and announcements, including office hour times and locations
- GitHub will be used for homework submission
- We will use several course websites:
 - <https://www.cmu-webapps.org> provides course login support and some demos
 - <https://grader.cmu-webapps.org> will run the homework grader

Lecture Schedule

The expected lecture schedule, subject to change, is as follows:

Date	Lecture Topic	Date	Lecture Topic
8/31	Introduction	10/19	Software Engineering
9/2	HTML & CSS	10/21	Teamwork
9/7	JavaScript & DOM	10/26	Security + OAuth
9/9	HTTP & Django	10/28	Sprint #1 Presentations
9/14	Cookies & Sessions	11/2	Internationalization
9/16	Bootstrap	11/4	Transactions
9/21	Forms & Templates	11/9	Sprint #2 Presentations
9/23	Authentication	11/11	Scalability
9/28	Models	11/16	Testing
9/30	Files & Images	11/18	Demos
10/5	AJAX	11/23	Demos
10/7	jQuery & WebSockets	11/25	Thanksgiving (NO CLASS)
10/12	Deployment+DB+Email	11/30	Review for Final
10/14	Mid-Semester Break	12/2	Best Projects

Important Dates

- Homework will typically be due weekly, during the first half of the course.
- You need to attend class for exercise/quiz credit (or attend the make-up session)
- You will need to attend class for your team's sprint presentations, held via Zoom during lecture time on 10/28 and 11/9.
- You need to be present for your team's final project presentation, aka the "demo". We plan to hold the demos in-person. (Your team chooses from a list of available dates and times.)

Video Recordings

- **We will** post video recordings of the lectures.
- You may **not** make your own recordings of lectures (or of any class meetings).

Textbooks

This course has no required textbooks as information about the topics covered in this course is readily available on the internet, and you may search for general information. But you might find the following texts to be useful references:

- **Mastering Django.**
 - You can buy it: <https://djangobook.com/>
 - But the first nine chapters are free, on-line: <https://djangobook.com/mastering-django-2-book/>
- **Pro Git.** Chacon. Apress, 2009.
 - Free online at <http://git-scm.com/book>
 - **Pro Git. Chacon. Apress, 2009.**
- **Software Engineering, 10th edition.** Ian Sommerville. Pearson, 2015.

Grading

Your course grade will be computed approximately (and, likely, exactly) as follows:

- 28% Homework (4% each for HW#1-HW#7, HW#0 doesn't count)
- 8% Quizzes (½ % each, if we have the expected 16 quizzes)
- 32% Final project
- 32% Final exam

If there are pandemic-related restrictions, there will be no final exam and we will adjust the weightings above, accordingly.

In 17-437, a 90% average (or above) is typically an A. In 17-637, 90% is typically an A-. No promise as to where the A+/A/A- cut-offs will be for 17-637. Same story for B grades at 80%, etc. We may curve these boundaries in your favor, but this is unlikely to be needed. ("Typically?" See late homework penalties, below.)

Homework

We expect to have seven homework assignments, due weekly, during the first half of the semester. Here are some details:

- Your homework solutions will be uploaded (aka “pushed”) to GitHub.
- You will grade your own homework using our AutoGrader (<https://grader.cmu-webapps.org>). We can also submit requests to grade it, to help debug problems.
- You may upload new versions and grade them until you get all the points on the homework.
- We will use your highest score for each homework.

Late Homework Policy

We understand that normal student-life events, including assignments, projects, and exams in other courses, can interfere with your ability to complete your work on time. Therefore, you may submit your homework late, after the due date.

Procedure

- If you are 4 or less days late on an assignment, you may push additional attempts to your GitHub repo and then grade them as usual.
- We will determine the submission date for each homework by using the date (Pittsburgh local time) of the first AutoGrader run that achieved your highest score for that homework.
- We will track the number of “late days” you have accumulated on each homework. (We only count whole days, so there’s no difference between being a second late or 23-hours late.)
- If you are more than 4 days late on an assignment, you should set up a time to talk to an instructor about how to get back on track in the course.

Penalties

- On the homework score, itself, we will not deduct points for use of late days.
- Students with fewer late days will be able to sign up earlier for project demo times.
- Students, who have used late days, whose course averages are “near” a grade boundary, will receive the lower course grade.
 - In effect, students who use late days give up their right to complain about having the highest course average in their grade bracket.
 - Note that each homework counts for approximately 4% of your course grade, so taking a few late days to improve your score is better than turning in a disaster, in terms of the effect it will have on your course grade in the end.
- If you use an extreme number of late days (e.g., more than 4 late days on any one assignment), we may lower your course grade, particularly, if you have not contacted the instructors to discuss how to get back on track in the course.

Late Project Policy

If you are unable to demonstrate your course project at the scheduled final presentation time during “demo week”, you may discuss with the instructors the possibility of demonstrating your project the following week with a reduction in your project grade.

Collaboration Policy

For homework assignments:

1. **Talk/Look:** You are encouraged to talk with and share ideas with other students, including examining and critiquing others’ solutions. You must cite the Andrew IDs of every student with whom you discuss the homework assignment. (You do not need to cite trivial conversations, like “You done with the homework yet?”)
2. **Share Screens, Not Files:** You may show others your code, but do not let them have access to your files. If they have access, they may be copied and then you’ll get into trouble.
3. **Copy Our Code:** You may copy into your homework solutions any sample provided to you in our course examples. You may only copy code from this semester’s examples.
4. **Don’t Copy Others:** You must independently create and turn in your own unique work. In particular, you may not copy another student’s files (or portions of files) or let another student copy your files (or portions thereof). Examining another student’s solution, as described in #1, above, so as to cause your solution to be trivially identical in a small way, is allowed, if cited.
5. **External Sources:** You may use external resources (books, internet sites, etc.) as references, but you may not copy files or substantial parts of files from external resources, and you must clearly cite any external resources you use.
6. **Citations:** Citations must be in a README .md file at the top-level folder of each homework assignment and project you turn in via GitHub. The first homework specification will detail what must be included in these citations.

For the course project:

- You are encouraged to collaborate with your teammate(s) and with other students for your course project.
- All project deliverables must be completed by you and your teammate(s).
- You may not copy another project’s documents or code for your project solution, or use substantial external code or documents obtained from any third party such as an Internet site.

There are of course some gray areas, such as receiving help you don’t fully understand or copying generic, boilerplate UI designs or configurations from the internet. In general, you should ask an instructor if you have any questions or concerns about the policy, or if you are unsure about the appropriateness of your own past or potential future actions. ***When in doubt, ask an instructor.***

Academic Integrity Violations

You should read and abide by the University Policy on Academic Integrity:

- <http://www.cmu.edu/policies/student-and-student-life/academic-integrity.html>

You should read and abide by the Collaboration Policy, in the previous section of this document.

In addition to the above, examples of academic integrity violations include:

- Coaching others step-by-step without them understanding your help.
- Making your work publicly available in a way that other students (current or future) can access your solutions, even if others' access is accidental or incidental to your goals.
- Helping someone else to copy code or written assignments (from you or other sources) that would be in violation of the course Collaboration Policy.
- Writing, using, or submitting a program that attempts to alter or erase grading information or otherwise compromise security of course resources.
- **Re-writing or otherwise modifying the commit history of your GitHub repository.**
- Lying to course staff.

The minimum penalty for academic integrity violations will be a lowering of your course grade, and **all** cases will be referred to the appropriate university disciplinary board. Be warned that the university disciplinary actions for cheating can be very harsh, especially in response to cheating by a graduate student. Note: There is no statute of limitations for violations of the collaboration policy; penalties may be assessed (and referred to the university disciplinary board) after you have completed the course, and some requirements of the collaboration policy (such as restrictions on posting your solutions) extend beyond your completion of the course.

Well-being Statement

At the end of the day, please remember this is just class. Take care of yourself and try not to stress. We are here to have some fun. We hope you are having fun, too – at least in this class.

Recorded lectures are being made available to allow you to keep up with the course in case of illness or other absences or just so you can watch our lectures again because you'll love them so much! :-)

The homework late policy is designed to help reduce your stress. If you're so behind that you're about to cheat (or help someone else cheat), please go to sleep and talk to us in the morning (or tell someone else to do this). We'll work something out.

If you or anyone you know is experiencing academic stress, difficult life events, or feelings of anxiety or depression, we strongly encourage you to seek support. Counseling and Psychological Services (CaPS) are available to help: call [412-268-2922](tel:412-268-2922) or visit their website: <http://www.cmu.edu/counseling/> Also, consider reaching out to a friend, faculty, or family member that you trust for help getting connected to the support that can help. ***And, Professors Eppinger and Telang are willing to talk with you, too, of course!***